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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,217	12/12/2000	Tim Anderson	UF-222XC2D2	7406

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EXAMINER

KILDAY, LISA A

ART UNIT PAPER NUMBER

2829

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/735,217

Applicant(s)

ANDERSON, TIM

Examiner

Lisa A Kilday

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Specification

35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms, which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: the specification refers to an apparatus, which can alternately perform MOVPE and HVPE (pg. 5, lines 10-11), a reactor that can deposit MOVPE or HVPE (pg. 5, lines 25-26), and growth of MOVPE and HVPE films in the same reactor (pg. 6, lines 28-29). It is unclear what the claims are referring to as "an apparatus". From the specification, an apparatus is defined in many ways including: an apparatus that can perform both MOVPE and HVPE, a cluster tool that performs both MOVPE and HVPE, or a chamber that performs both MOVPE and HVPE.

Claims 1-11 are objected to because of the following informalities: "apparatus", "reactor", or other suitable term that conveys the claimed invention should replace the term "device". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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The scope of claim 1 is indefinite due to the ambiguity surrounding the corresponding structure to the means. See objections to the specification.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-11 are rejected under 35 U.S.C. 102(a) as being anticipated by Kryliouk et al. WO-99-66565. Kryliouk et al. discloses the limitations of a device comprising a means for MOVPE and a means for HVPE. Since the PCT is a mirror image of the instant US application, refer to the following pertinent sections: abstract; pg. 4, lines 12-30; fig. 1A; pg. 8, lines 21-28; pg. 9, lines 10-14; pp. 19-20.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaudo et al. (6,533,874). In light of the 112 ¶2 rejection, an apparatus is defined in many ways including: an apparatus that can perform both MOVPE and HVPE, or a cluster tool that performs both MOVPE and HVPE. Vaudo et al. discloses a device comprising: a means for performing MOVPE and a means for performing HVPE (col. 6, lines 37-50; fig. 2). Vaudo et al. (6,533,874) teaches that forming a GaN by MOVPE on a HVPE GaN reduces cracks and roughness. Vaudo et al. teaches a MOVPE and a HVPE apparatus. (abstract; col. 6, lines 36-52; col. 15, lines 35-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 5-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Vaudo et al. (6,533,874). Vaudo et al. teaches: a means for performing MOVPE and a means for performing HVPE (col. 6, lines 37-50; fig. 2). However, Vaudo et al. does not teach wherein said device can transition from MOVPE to HVPE in situ. However, it would have been obvious to one skilled in the art at the time of the invention to combine an apparatus to include the functionalities of both MOVPE and HVPE in order to increase efficiency, save time, and eliminate transfer of the substrate from the HVPE and MOVPE chamber, thereby having a device that transitions in situ.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "Dislocation distribution and subgrain structure of GaN films deposited on Sapphire by HVPE and MOVPE", Dunn et al., Mat. Res. Soc. Symp. Proc. Vol. 482, pg. 417-422 and Yuri et al. (6,274,518) – especially col. 1, lines 27-47.

Applicants failed to disclose their own relevant prior art such as:

"The effect of surface nitridation of LiGaO₂ substrates on the quality of MOVPE GaN", Kryliouk et al., The 1997 Joint International meeting, Paris, August 31-September 5, 1997, Electrochemical Society, abstract No. 1830, pg. 2104;

WO 99/66565, Kryliouk et al., 23/12/99.

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"GaN substrates: growth and characterization", Kryliouk et al., 3rd International Conference on Nitride Semiconductors, Montpellier, France, 4-9 July 1999. Physica-Status-Solidi-A (Germany), vol.176, no.1, p.407-10, 16 Nov. 1999.

"Thermal stability of MOCVD and HVPE GaN layers in H₂, HCl, NH₃ and N₂", Mastro et al, Fourth International Conference on Nitride Semiconductors, Denver, CO, USA, 16-20 July 2001. In: Physica-Status-Solidi-A (Germany), vol.188, no.1, and p.467-71, 16 Nov. 2001.

"Large area GaN substrate", Kryliouk et al., 4th Intl. Workshop on expert evaluation and control of semiconductor materials and technologies (EXMATEC 98), Cardiff, UK 22-24 June 1998.

"Growth of GAN single crystal substrate", Kryliouk et al., Materials Science Engineering, vol. 59, no. 1-3, pp. 6-11, 6/5/99

"GaN grown by H-MOVPE on lattice-matched oxide and silicon substrates", Mastro et al., Materials Science Forum, vol. 389-93, pt. 2, pp. 1473-6, 2002.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0957. See MPEP 203.08.

Any inquiry concerning this communication from the examiner should be directed to Lisa Kilday whose telephone number is (703) 306-5728. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo, can be reached on (703) 308-1233. The fax number for the group is (703) 305-3432. MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.

Lisa Kilday

LAK

4/17/03


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